

## EXECUTIVE SUMMARY

The United States Air Force is conducting a Dense Nonaqueous Phase Liquid (DNAPL) Source Delineation Project at Operable Unit 2 (OU2), Hill Air Force Base (AFB) in Utah. The focus of this project is the use of partitioning interwell tracer tests (PITTs) to determine the volume and extent of DNAPL contamination in a shallow alluvial aquifer at OU2. This report documents the DNAPL source zone characterization activities and results of the Provo alluvium characterization field work completed as Phase I of the Source Delineation Project.

OU2, located on the northeastern boundary of Hill AFB, was used from 1967 to 1975 to dispose of unknown quantities of chlorinated organic solvents from degreasing operations. These DNAPLs, primarily trichloroethene (TCE), were placed into at least two unlined disposal trenches underlain by an alluvial aquifer. This shallow, unconfined aquifer is composed of a heterogeneous mixture of sand and gravel and is contained in a buried paleochannel eroded into thick clay deposits. A large volume of DNAPL remains in the subsurface, predominantly as an immobile or "residual" phase retained as ganglia by capillary forces in the aquifer's pore spaces, and also as a mobile phase pooled in topographic lows on the surface of the clay aquiclude.

The objective of the Phase I DNAPL source zone characterization activities was to provide the stratigraphic, hydrogeological, and geochemical information necessary to design the PITT well field. The primary focus of these activities was the delineation of the buried paleochannel. A second objective was to collect and analyze soil samples from potential DNAPL zones for preliminary indications as to the distribution of DNAPLs in the buried paleochannel. The data acquired from the field activities conducted in Phase I will be used to build a geosystem model to be used in numerical well field optimization simulations and PITT design modeling.

The Phase I characterization field work included:

- Establishing an orthogonal grid across the area of OU2 containing the buried channel to provide a reference framework for the tasks that followed (the area within the grid is referred to as "the site")
- Conducting a ground-penetrating radar (GPR) survey designed to delineate the location and width of the buried channel
- Conducting a cone penetrometer test (CPT) survey used to provide stratigraphic information on the alluvium in the buried channel in areas not yet characterized
- Advancing 10 soil borings to investigate those areas where the CPT was unable to reach the clay aquitard and to provide soil samples for analysis
- Completing a final horizontal and vertical survey of each CPT and boring location.

Over 4,150 linear feet of GPR data were acquired during the GPR survey, which focused on the uncharacterized northern and southern portions of OU2. The GPR survey also extended past the area encompassed by the containment wall to investigate the area in the vicinity of the ends of the channel truncated by the hill slope. A total of 63 locations (approximately 2,600 linear feet) were investigated with CPT direct push technology. Upon completion of the CPT survey, 10 confirmation soil borings were drilled and sampled along the centerline of the buried channel.